

REMARKS

The present application has been reviewed in light of the Office Action dated November 1, 2007. Claims 14 and 16-18 are presented for examination. Claims 1-13 and 15 were previously canceled. Claims 14 and 18, the only claims in independent form have been amended to define Applicants' invention more clearly, and Claim 16 has been amended purely as to matters of form. Favorable consideration is requested.

The Office Action states that Claims 14 and 16-18 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,930,722 (Nakamura et al.) in view of U.S. Patent No. 6,963,372 (Hiyama et al.). Applicants respectfully traverse the rejections and submit that independent Claims 14 and 18, together with the claims dependent therefrom, are patentably distinct from the cited references for at least the following reasons.

Claim 14 is directed to a driving method for a CMOS type image pickup device having pixels. Each pixel includes a photoelectric conversion unit and a transfer MOS transistor for transferring photoelectric conversion signal charges generated by the photoelectric conversion unit to a floating diffusion region at an input terminal of an amplifier element. The image pickup device includes signal lines configured to output an amplified signal to a capacitor arranged at each signal line.

The driving method includes, for a pixel, a driving step that entails at least a first and a second transfer step. The first transfer step is performed to apply a pulse to a transfer switch to transfer a part of signal charges generated during one accumulation period by a photoelectric conversion unit to a floating diffusion region. The second transfer step is performed subsequently to the first transfer step to apply a pulse to the transfer switch to transfer

a remaining part of the signal charges generated during the same one accumulation period by the photoelectric conversion unit to the floating diffusion region, before reading out a signal from the pixel to a corresponding signal line. No reset of the floating diffusion region is performed between the first and second transfer steps of the signal charges.

A notable feature of Claim 14 is that, in the first transfer step, a part of signal charges accumulated during one accumulation period is transferred to a floating diffusion region, and, in the second transfer step, the remaining part of the signal charges accumulated during the same one accumulation period is transferred to the floating diffusion region.

Nakamura et al. relates to an amplification-type image pickup apparatus. In the Office Action, it is alleged that Nakamura et al. teaches all the elements of Claim 14, except that it fails to teach an “image pickup device that outputs charges to a capacitor on a signal line and a switch element for controlling electric continuity of the signal line and the capacitor.” The Office Action then contends that Hiyama et al. remedies the deficiencies of Nakamura et al.

Unlike Claim 14, the cited references disclose a method in which signal charges accumulated during different accumulation periods are read out through a plurality times via a plurality of reading steps, and are added.

Applicants submit that a combination of Nakamura et al. and Hiyama et al., assuming such combination would even be permissible, would fail to teach or suggest a driving method for a CMOS type image pickup device, in which the method includes, for a pixel, “a driving step comprising at least a first and a second transfer step, the first transfer step being performed for applying a pulse to a transfer switch to *transfer a part of signal charges* generated during one accumulation period by a photoelectric conversion unit to a floating diffusion region,

and the second transfer step being performed, subsequently to the first transfer step, for applying a pulse to the transfer switch to *transfer a remaining part of the signal charges* generated during the same one accumulation period by the photoelectric conversion unit to the floating diffusion region, before reading out a signal from the pixel to a corresponding signal line, wherein no reset of the floating diffusion region is performed between the first and second transfer steps of the signal charges,” as recited in Claim 14 (emphasis added).

Accordingly, Applicants submit that Claim 14 is patentable over the cited references and therefore respectfully request withdrawal of the rejection under 35 U.S.C. § 103(a).

Independent Claim 18 includes features similar to those of Claim 14, discussed above, and is believed to be patentable for at least the reasons discussed above. The other rejected claims in this application depend from Claim 14 and therefore are submitted to be patentable for at least the same reasons. Because each dependent claim also is deemed to define an additional aspect of the invention, individual consideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable consideration and early passage to issue of the present application.

No petition to extend the time for response to the Office Action is deemed necessary for this Amendment. If, however, such a petition is required to make this Amendment timely filed, then this paper should be considered such a petition and the Commissioner is authorized to charge the requisite petition fee to Deposit Account 50-3939.

CONCLUSION

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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